Application No.: 10/580,346

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A diamond n-type semiconductor comprising a first diamond semiconductor having which has n-type conduction and in which a distortion or defect is artificially formed, [[;]]

wherein [[,]] in said first diamond semiconductor, a conductor exhibits an electron concentration negatively correlated with temperature in a temperature range of at least which has a width of 100°C or more and is included within at least the a temperature region from 0°C to 300°C.

- 2. (Currently Amended) A diamond n-type semiconductor according to claim 1, wherein, in said first diamond semiconductor, the conductor exhibits a Hall coefficient positively correlated with temperature in a temperature range of at least which has a width of 100°C or more and is included within at least-the temperature region from 0°C to 300°C.
- 3. (Currently Amended) A diamond n-type semiconductor according to claim 1, wherein the temperature range, exists over at least 200°C included within the temperature region from 0°C to 300°C, has a width of over 200°C or more.
- 4. (Currently Amended) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor has a resistivity of 500 Ω cm or less at least at a temperature within the temperature region from 0°C to 300°C.
- 5. (Currently Amended) A diamond n-type semiconductor according to claim 1, wherein the electron concentration of said first diamond semiconductor is always at least 10¹⁶ cm⁻³ or more in the temperature region from 0°C to 300°C.

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- 6. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor contains more than 5×10^{19} cm⁻³ in total of at least one kind of donor element.
- 7. (Original) A diamond n-type semiconductor according to claim 6, wherein said first diamond semiconductor contains at least P (phosphorus) as the donor element.
- 8. (Original) A diamond n-type semiconductor according to claim 6, wherein said first diamond semiconductor contains at least S (sulfur) as the donor element.
- 9. (Currently Amended) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor contains an impurity element other than [[the]] <u>a</u> donor element together with the donor element.
- 10. (Currently Amended) A diamond n-type semiconductor according to claim 9, wherein said first diamond semiconductor contains at-least Si of 1 x 10¹⁷ cm⁻³ or more of Si as the impurity element.
- 11. (Previously Presented) A diamond n-type semiconductor according to claim 1, wherein said first diamond semiconductor is monocrystal diamond.
- 12. (Previously Presented) A diamond n-type semiconductor according to claim 1, further comprising a second diamond semiconductor provided adjacent to said first diamond semiconductor and turned out to be n-type,

wherein, in said second diamond semiconductor, a conductor exhibits an electron concentration not negatively correlated with temperature and a Hall coefficient not positively correlated with temperature.

13. (Previously Presented) A semiconductor device at least partly employing a diamond n-type semiconductor according to claim 1.

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14. (Previously Presented) An electron emitting device having the diamond n-type semiconductor according to claim 1 employed in at least an electron emitting part thereof.

15. (Currently Amended) A method of manufacturing a diamond n-type semiconductor according to claim 1, said method comprising the steps of:

preparing a diamond substrate; and

epitaxially growing said-first a diamond semiconductor on said diamond substrate while artificially introducing an impurity element other than a donor element to said diamond substrate, whereby said diamond semiconductor has n-type conduction and has a distortion or defect which is artificially formed therein,

wherein, in said diamond semiconductor, a conductor exhibits an electron concentration negatively correlated with temperature in a temperature range which has a width of 100°C or more and which is included within the temperature region from 0°C to 300°C.

16. (Original) A method of manufacturing a diamond n-type semiconductor according to claim 15, wherein Si is artificially introduced as the impurity element to said diamond substrate.